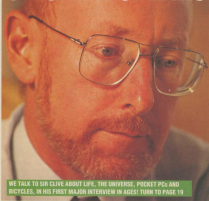


POPULAR FIRST WITH NEWS AND REVIEWS! COMPUTING 55p AUGUST 3 1989 WEEKLY

SINCLAIR SPEAKS



WE TALK TO SIR CLIVE ABOUT LIFE, THE UNIVERSE, POCKET PCS AND BICYCLES, IN HIS FIRST MAJOR INTERVIEW IN AGES! TURN TO PAGE 19



ARCHIMEDES AND BBC NEWS



DUNCAN EVANS AT THE
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STOPWATCH LISTING!

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GAMES

- NEW ZEALAND STORY
- ALIEN LEGION
- FIENDISH FRIDAY
PREVIEW

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BUDGETS BURST OUT

THE NEW budget games labels are being launched this summer, bringing a host of new games and some rebirth to the 8-bit market at £2.99.

Microdom is the name of a new company set up by Jonathan Edgar. The first games for all the major 8-bit machines are expected to be in the shops at the beginning of September, priced at £2.99. Games will be in cassette format initially with discs probably following later.

Prices of carts or equipment are premium for the first games to compete each game, many of which will be shoot-outs. What is described as a "real shoot-out" called "Being" is currently top of the list. It runs on the C64 and has over 400 scrolling animated screens.

Edgar, who previously ran a company called Composition (producing utilities for the Spectrum), commented:



John Edgar's independent company plans cash prizes to split games.

"We are a completely independent company and all our games are original. Once the label is established we will wrap a full price label and perhaps deal with 16-bit software as well."

Secondly, the work sets the launch of a new budget label by the man who has previously opened up markets for the likes of Mastertronic. Code Britain-owned Pinfield Distribut is a distributor. "We're done if the everyone else so why not do it for ourselves?" commented a company spokesperson.

Now Richard Boffy has formed a new budget label, Cobra, and signed a back-catalogue deal with Games for two games, all of which will retail for £2.99. The first releases will be M&M, Cosmic Probe and Knight Warrior on C64, Amstrad, Spectrum and Atari 8-bit versions. Subsequent releases will be mainly conversions of games already available.

This Week

LETTERS p.9

Ecological concern... the Laxarus virus... Dashed user group... and many more misfires.

TAX PLANNER, p.10

ST owners can get to grips with their tax returns using Personal Tax Planner.

PUZZLE, p.10

Divisions among friends.

HOTLINES, p.12

Which computer do you own? Do you conform to Duncan's stereo-types?

NEW GAMES

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64 CD GAMES, p.17

Is the new games concept worth the hassle?

SIR CLIVE SINCLAIR

INTERVIEW, p.19

The man who has brought mass market home computing to Britain opens up to Popular Computing Weekly in this exclusive interview.

BYTES & PIECES, p.24

Stopwatch—a program-timing lifeline for the Amiga.

BBC KNOW REPORT, p.31

Incomprehensible lyric Duncan Evans heads off to the Alexandra Palace.

KEN GARRICK, p.36

Linking the Amiga A500 and a terminal... BBC buffers... ST mice... PC emulators... Spectrum joystick interface... and more.

REOBACK, p.38

A home programme years for the "good" only days.



total of resolution from Zing.

Mavis on a QWERTY

MIDSCAPE is certainly launching some interesting software lately... following the inimitable *Life* and *Death* game comes a crop of productivity software. New titles include *Zing*, *Mavis*, *Beamer*, *Teaser*, *Typing* and *The Secretary Bird*.

Zing is a 3-D graphics package for

the PC and Mac that allows users around images to be transported between the two machines. Symmetrical 3-D shapes are created by an outline on an axis which then generated by a solid of revolution by rotating the outline around the axis.

A profiler allows users to draw multiple 3-D cross-sections to produce a 3-D image. Priced at £149.99, *Zing* is aimed at CEE/PC and its image format is compatible with all major packages.

Mavis Beamer *Teaser* Typing is a learning program with a difference: for the Atari ST, Amiga, Apple II GS, Mac or PC. In-built AI routines supposedly tailor your lessons to your ability but, Mavis, your innovative instruction, has some pretty neat tricks up her sleeve. One lesson involves a road race, in which you are sent headlong down a race track in a flat car, losing speed (and the game) whenever you make a typing mistake. The price is £29.99.

The Secretary Bird is a four in one effort pack for the PC with a WF, spelling checker, database and spreadsheet. The price is £39.99. *Midscape* can be contacted on 044 486 143. ■ *Fleishish Freddy* preview: see page 12 in this issue.



Dead PC1 may live

JEFF EARL, (above), the programmer now marketing computers at Commodore, may revive the time's cheap PC-clones, the PC1, which was priced at £249. The machine died a death this year when suppliers dried up after German schools switched over to PC. STs. Commodore Germany, which supplies hardware in the U.K., stopped making the base model.

In the U.K., this has left the Amstrad PC160 at £299 the cheapest PC available. In an exclusive interview with *Popular Computing Weekly*, Earl said he is considering reintroducing the 8088-based model if there is sufficient demand. Future plans for the IBM PC line, says Earl, include battery and modem powered laptops, and two desktops based on the 80386 and 80486. Launch dates for the Amiga 1200 and 1600 are still fuzzy, with no firm dates being offered.

Meanwhile, rival Atari has stated August 1989 as launch day for its TT: the 80486 based ST workstation.

Advertising consolation

EXPECT some well-wired Segs ads on your TV sets—Sega has appointed the agency that does the *Demolition* and

Hero adverts to make a series of TV ads—can you imagine the catch line? *Play* writes are wondering what the stars in hand drawn and large-red-headed-ops will come out with. Maybe "Sega—half the list of other consoles, half 99 percent of all known alien life."

■ New Sega games reviewed page 15.

NEW AMIGA, C64 PACKS

EXCLUSIVE details of these new Amiga and C64 bundles have been obtained by *Popular Computing Weekly*.

Independent software publishers, The Disc Company, has put together the packages, which ensure instant will not be officially endorsed by Commodore.

There are two Amiga packs and one for the C64 on the cards. These are expected to include:

- The Starter Pack, including an £500, the *Kind Words* 1.0 word processor package and three games, including *Fluffy Day* and *Crash Cars*.
- The Home Office Pack, including an £800, the Publisher's Choice DTP package (made up of *Kind Words* 2.0 plus *PageMaker* 1.0) and a database.



Calling the Home Office with The Disc Company.

• The C64 Test Pilot Pack: this special two disc will include five simulators (not all flight sim) for the C64, includ-

ing *Advanced Tactical Fighter*, from Digital Integration.

Source suggests that both the Starter and Test Pilot packs are already being sent marketed in New Zealand and Belgium respectively, where The Disc Company has subsidiaries.

The packs are expected to be launched in the U.K. either before or during the PC Show - although currently the Disc Company will not be exhibiting; dealers and distributors are expected to stock the products.

Popular Computing Weekly understands that the bundle prices are likely to be as follows: £700 Starter Pack, plus £700, £500 Home Office Pack, plus £440 and C64 Test Pilot Pack, around £150.

Hackers get the message

UNCLE Sam has come down like a ton of bricks on hackers in the last week, with Kevin Mitnick jailed for a year and the announcement that alleged Postage-run virus spreader Robert Morris is in the charge of illegal computer entry.

Mitnick was convicted of using stolen passwords to access computers. He will serve one year in jail and six months in rehabilitation of a halfway house.

Robert Morris, whose alleged virus virus on the Postage's Internet affected 6000 UNIX terminals last October, will be charged with illegal manipulation of a 60,000-machine network. The virus program replicated a loop-hole in UNIX that allowed it to tag itself onto e-mail messages.

Photon Paint under an Illusion

AFTER the strange between Activision and MicroIllusions over who would distribute Photon Paint 2 and Magic 5 in the U.K., it seems that MicroIllusions, who produce the package in the U.S., have won out.

The packages have been available in the States for over a year now but have only made appearances this side of the Atlantic in demo form and are in need of a helping. However, the products are now in the shops and are being distributed by MicroIllusions (Europe) which can be contacted on 0400 000000.

Fonetic thisorus faw Ameega

KUMA CLASH is here the first standard thesaurus for the Amiga, based on Longman's Pocket Thesaurus. It-Riget has over 150,000 words and phrases allowing users of word processors or even databases to expand their vocabulary.

A phonetic spelling checker looks for alternative in words based on how they sound rather than how they are

spelt. This is expected to help users whose first language is not English.

Please note that no extra disk drive is required or a shared disk to the standard Amiga is insufficient to run it.

A special offer price of £29.95 inc. VAT applies to K-Riget for the Amiga and for the PC and ST versions already available. Contact Kuma on 0757 4320.

Sculpted Amiga

AN INCREASE of between 200 and 800 percent in basic key-tapping speeds is claimed for the enhanced graphics package Sculpt XX00, on the Amiga.

If you wish the power bestowed upon you by Photoshop, this package allows you to create your own software, says Martin Lewis of the Amiga Centre, Scotland. Among a host of features are supported and cubic splines to smooth the joins of organic objects, a range of warpers including rotation, mirror and mental and intersections interface resolution, which are among graphics modes supported.

Contact the Amiga Centre Scotland on 024-257 1260.



The juggling Sculpt XX00 rendered smooth.



Sam Cooper, developing SAM Corp. for the Amiga on an IBM PC.

SAM develops

SOFTWARE developers have to start creating programs for the long-awaited SAM Corp, or to convert IBM software to take advantage of the Corp's extra graphics and audio capabilities, will soon be released.

Professional software is usually written in assembly language using development systems. Programmer's Development System (PDS), the most popular, runs on PCs and comprises compilers, software tools and a special interface for the target machine. MCT are collaborating with PDS to produce the development system for the SAM Corp. Even so, in combination with the the Juggling graphics package and will be available before the Corp's launch.

IN BRIEF

Chartbound

BARFAGE, a new release from console-makers Sega, has shot straight into the Gallup games chart at number 2. Reflecting an increased popularity in console games, Sega attribute their success to a string list of over 40 games with an average of three in four new ones each month.

Sega's distributor Virgin Mastercraft has announced a new deal with Ocean which will mean the Master System Plus is stocked in all their branches.

Miracom up for sale

MIRACOM makes Miracom has been put into the hands of creditors while the firm works out its troubled finances. Following the failure of a buy-out by the firm's suppliers, US Robotics, creditors Clark Gully has been called in to administer creditors while an alternative buyer is sought. Managing director Davey John told *Popular*: "We are the only people who have the approval of US Robotics and I have very confidence we will continue trading." "I will now consider up to all creditors and under the administration of the receiver."

BT takes over Micronet

BRITISH Telecom has announced an increase in its holding of shares in Telecom Group, publishers of *Micro*, from 40 percent to 100 percent. John Conway of the BT Managed Network Services division commented: "Telecom's successful growth into such as Micromet, InterNetware, and others will form a key factor in our activities."

ST gets TEX-ed

TEX, the document processor and typesetting program designed by Donald Knuth, is now available in public domain for IBM PCs and compatibles. It is supplied on three double-sided discs for £40 per pkg from The Text Word Software Library, PO Box 362, Walsbrook, Dorset BH21 2YD.

Stateside

Steve Gold reports on how news from the U.S.



Apple to unveil Mac lap-top

APPLE will unveil its first laptop Macintosh (and this month at the Boston Playworld Expo) in the U.S. The machine, which has been codenamed *Lapmac*, weighs 14 to 17lb, depending on configuration and is based on a Motorola 68000 microprocessor running at 16MHz.

In its basic configuration, Lapmac will have 1MB of RAM and a single 1.44MB 3.5in. floppy drive, pricing from \$2,000 upwards. The top-of-the-range machine, with a 40MB hard disc, internal modem and as much as 5MB of RAM - a great deal for a laptop - will cost \$4,000.

Part of the reason for the weight of the Lapmac is that it is powered by an internal lead-acid battery, just like the heavy one in cars. The LCD screen, however, is more up-to-date, and is a 3.5in. active matrix unit capable of rendering a full 640x480 monochrome screen. Other features of the Lapmac are the same number of PD ports as the standard Mac SE, with an expansion board slot and an 80-MHz Processor Direct Slot.

ST utility

• Maxwell Computer Products Limited has announced an interesting Atari ST utility package, *Copy ST*. The £24.95 package allows almost all ST packages to be run using a single click of the mouse button. Built round a 64-M interface, *Copy ST* presents



Power up in your lap from Apple.

the user with 15 selection boxes and the ability to load any program name into the boxes.

Other features include a pop-up digital clock, a logging facility and a powerful macrofile loader option. MCFU can be contacted on 0800-303-000-079.

Super ST

• Start Magazine in the U.S. is launching a world exclusive on the ST Plus, also known as the Super ST. The September issue, due at the end of this month, has an exclusive review on the machine. Details of the machine are sketchy but it is known to be de-

voted compatible with the existing ST series and has a 4,096-colour palette and eight channel stereo sound as standard features. CPU details on the ST Plus vary, depending on the series. My guess is that the machine will be 68020 microprocessor-based and will have between 1MB and 4MB of RAM. The machine will be unveiled officially during September, suggesting a U.S. Personal Computer Show unveiling on this side of the Atlantic. Pricing is unknown but Jack Tramm announced previously that the ST Plus will be priced competitively, suggesting a \$4,000 to \$5,200 price in the U.S.

PD pitch

• Also in the pipeline from Atari is an ST package, *Game Maker*. The public domain package is pitched at software writers and users who want to create a rolling demonstration of ST packages, without the fuss of running the program code proper.

Although *Game Maker* is aimed at developers for ST window displays, first reports from the U.S. suggest that some enthusiasts are using the package to grab games and ball versions from protected popular software, to incorporate the code in their programs. The package could bring a whole new meaning to the clone program world. It could also spell trouble for the major games producers.

Amiga animation

• Amiga users are turning to a new public domain and shareware company in the U.S., *Proshare Software*. Proshare has issued one of the largest U.S. collections of PD and shareware software, with the latest lot product, *Cost in Amiga*, featuring a 40-second real-time animation for the Amiga.

The three-disc PD package sells for \$12 but requires a full 2MB of RAM in use. Call Proshare for a copy of the catalogue on 800-435-364-696.

Key revival

• Amiga owners are beginning to rediscover the Control I key when using the CLS. Instead of pressing return after every command line, pressing Control I stores the command and the return key is pressed at the end of several lines. Thus a chain of commands can be issued for rapid execution.

The Control I key was detailed in early Amiga 1000 manuals but, for some strange reason, has not been detailed for Amiga and Amiga 2000 2500-series machines. It works creating a script file, so it seems a pity that Commodore in hiding this powerful feature from the public. Thanks to John Byrdell of the Amy Today on-line newsletter for this tip and for very useful tips.

SHOWTIME

SEPTEMBER 27 - OCT. 1 The Personal Computer Show

ExCeL Court, London
Organiser: Mottifield
Tel: 01-486 1795
Nearest tube: ExCeL Court

OCTOBER 4 - 6 International Desktop Publishing Show

London Arena, Docklands, London
Entry by prior application only
Organiser: Database Exhibitions
Tel: 01-344 476007
Nearest tube: Cross Harbour (Docklands Light Railway)

NOVEMBER 1 - 4 MacUser Show

Olympia, London
Organiser: Mottifield
Tel: 01-486 1795
Nearest tube: Olympia

NOVEMBER 7 - 9 Computer Graphics '89

Alexandra Palace, London
Organiser: Elmheim Online
Tel: 01-486 4466 ext. 204
Nearest tube: Wood Green

NOVEMBER 11 Alternative Micro Show and Electronics Fair

Bingley Hall, Staffordshire
Show Ground
Organiser: Taurus Computer Systems
Tel: 0473 602460
Nearest station: Stafford St

NOVEMBER 24 - 26 Computer Shopper Show

Alexandra Palace, London
Organiser: Database Exhibitions
Tel: 0625 679966
Nearest tube: Wood Green



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C	0.0000	0.0000	0.0000
D	0.0000	0.0000	0.0000
E	0.0000	0.0000	0.0000

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Abstract

1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 2680, 26

1. *Journal of the American Medical Association*, 2000; 283: 2689-2695.



PAPER

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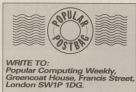
STAR LETTER

Lead-free in his pencil

I wholeheartedly agree with David Wray's criticisms regarding the environment. Yes, bottles involving modern electronics are more environmentally friendly than some other products but at what cost? Essentially, how much damage has been done to the environment in order at the present state-of-the-art?

Furthermore, I wonder what proportion of electronic sales are bought by serious hobbyists compared to those buying gadgets in order to 'keep up with the Jones' with no regard to the environmental cost of their manufacture.

You mention the use of unleaded petrol but what of the extra engine work requiring more frequent replacement - at what cost is the



environment - perhaps even greater than using leaded petrol. I could go on...

Perhaps we should celebrate the Internal Combustion Engine then perhaps the environment may stand a chance if it's not already too late. Paul J.R. Aronson, Milton Keynes

Going loco

I have an Amstrad 6300 used for writing a book and virtually nothing else. After changing from Loco 1 to Loco 2, I met the problem of changing layouts for the insertion of quotations and here, although for my purposes only margins and type size are involved and although I can not close up, I cannot get them on to Next Layout for my 6300 text. Nor can I get back to the original layout without resetting each.

When I worked with Loco 1 I had no such difficulty and, although I have tried to follow the Loco 2 guide, somehow or other I fall down on the process and have reached the point of giving up unless I can get some outside help.

None of the trouble is that, in my requirement, just too many options

are open. All I want is to change type size and margin, to have this layout named QUOTE (or a number), to bring it up with only one or two actions and, when completed, to go back to those Layout with a single action. I do not want anything else, which might confuse me.

Charles Jackson, Sybil
Such layouts are changed from the 1st Document set-up menu (where you change the headers). So, once editing your TEMPLATE, SET, press F1 and select DOCUMENT SETUP then press F2 to select LAYOUTS. Then select CHANGE STACK LAYOUTS. The layout list will then come up showing your layout and press ENTER. Then edit the layout to your liking. With F1 you can call it QUOTE or whatever. Then press CANCER and go back to the template. Now it's there if it is

Just say no

This week, after many months of trying to get rid of viruses called SCA and its brethren from my collection, I succeeded. Now, another more prolific virus has moved its ugly head (has anyone heard of Lazarus?) If you have, what can I do to kill it? I can quite honestly say that I possess

no pirated software - I bought SCA from a borrowed disc, so I wasn't. Nor have I tried to hack my way into any games. I'm not clever enough to do that. I do not own any F.D. software, so I cannot understand how I have acquired it.

I have a suspicion that it could be the efforts of a software protection program, that has broken out somehow, as a quick look at the disc in workbench revealed it as Lazarus and not SCA, and this happened after it had crashed and ceased to load any more. I tried two virus killers on it and subsequent discs that went the same way, but to no avail. Helpdesk helped in revealing that all cylinders were dead. Even on both sides and now they all read 'unreadable' with corrupted files.

My latest game, P.D.P.F., has died after only two days and a new created Lazarus. It's the last news I have received all progress on my Amiga 500 until I can do something to cure this evil. Can anyone help?

F. Biancheri, London SW20

No profit

I would like to tell readers that the CYM & MDOX Users' Group has published Volume One of its MDOX Software Library Catalogue. This volume covers the CYM MDOX Library, the PC-New Library, Orb-Bug Software, and ALDE Publishing's CYM-BODY.

All this software is now available to members of this group for the details of the catalogue and of membership, please contact Neil Hines (London) at 71 Mill Road, Basing, Dorset.

Ken Dool, TEL

Volume Two, The PC-600 Library is at present only available on disc (also from Hines).

The group is a non-profit making members' club, and in addition to its software library, it publishes a journal, runs a book lending library, and provides a bulletin board on Windsor VT32 99008. The protocol is 6400, no parity, full duplex, with automatic selection of baud rate. Much of the software is available via the bulletin board.

J.E. Laidlaw, Oxford

Euclidian geometry group

I am writing to inform you of a new user group which has been formed to support users of the Archimedes 3D design program, Euclid.

'Euclid', as the group is known, will, for an annual subscription of £10, provide a quarterly newsletter including Euclid files, utilities, hints and tips, letters in the form of a disc.

The first issue will be available in October, then January, April and July.

Members will be encouraged to exchange ideas and material through the group in order to increase the effective use of both Euclid and the Archimedes.

Further membership details are available from Euclid's authors, Art Computers, on 0233 92255.

Richard Holmwood, Elmwood, Digsway

Lines on Popular

We made the choice to stand in the garden

Strolling the stretch of rolling circuits

The brown, earthy patch was laden with wine.

RGB, disks of data and white DOS notes.

Why is it burning like Grandma's fire?

It was a chance that trusty red legals were really saved his glories of Nijras, his spare full of alien vegetables and grass, his array of ghosts and terror tactics, hatch box lighters, his companion for computers and his pedestrian ones.

Oh let her read of war!

More and then not could ever be granted

To be reading Popular! Popular! Oh to be Popular!

Susan! (Pamela),
Preston

Lost tome

Some time ago I purchased Decision Maker from Trippett Publishing Limited, then their Decision Application Through Learning series. Unfortunately I have lost the book that accompanied the program and find I am unable to run the program without it.

I have been in touch with Trippett but they say they no longer handle this range so they cannot be of any assistance to me.

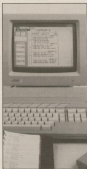
I am hoping that perhaps one of your readers could put me in touch with someone who could supply me with the book I need to run the program.

A. Shrimpton, 25 East Avenue,
Bailwood Estate, North Shillish,
York and West YO22 7BL



Money for nothing

Does your taxman have the upper hand?
Andrew Banner reviews an accounting
package to help you with alien customs.



Bare life — taxed to death. The statement is true but are you being charged more than your share? The only way to discover that is to spend hours working out your tax returns or to employ an accountant to do the same job. Accountants are not cheap and calculating your own tax can be a headache, especially if you have difficulty understanding the complex system.

Where do you turn? Do you trust that local income tax inspector and hand over your hard-earned wages obligingly, or do you take steps to make sure that you give him only what he deserves?

Personal Tax Planner is a new program from Digita International for the ST. It is also available for IBM and compatibles, Amstrad PCW and Commodore range, and will calculate your tax returns for any given tax year.

Unlike many of the newer personal productivity software packages for the ST, Personal Tax Planner is menu-driven as opposed to using the GEM environment. Its not for that deter you before you know what the program can do. The menu system is a tried and tested method of operating software and in this case works very well. I think if GEM were used it might have hampered the use of the software, although it could have looked more presentable.

Designed by an accountant, Personal Tax Planner offers the ability to enter, amend, examine and delete data. The data can be in different forms, such as your main income, any extra income, interest received from bank and building society accounts and pensions, although there are many more options. Once you have input all your income for a single tax year you can have the program compute the amount of tax payable on your income. With options to display or print the data, the program will display, in detail, all your income data and then analyse it. Finally, you will be given a figure which is the tax you should have paid. Of course,

you need not enter information about the whole year and can restrict certain months.

Income data can be used to enter and loaded again and there is no file security, no passwords, no comparison of data, no jumbling. In short, anyone can load any compatible file and examine it without difficulty.

The biggest asset of Personal Tax Planner is its ability to protect tax returns from what-if situations. If you were considering a secondary income you could input further data to find the tax payable on your new or prospective income, since you have received a figure the data can be deleted to return you to your actual income.

Personal Tax Planner appears to be somewhat limited in its scope at first, but the data menu can drop and include many income options. The big let-down of the software is the lack of security and the poor instruction manual, which just skims the surface of the software and provides little information on the country's tax system.

If you are considering this software, remember it is the only one of its kind. After buying it you are likely to need one of the many books on the U.K. income tax system before you can understand the range of Personal Tax Planner fully.

CONTACTS

Digita International 0208 270273
Price: £28.95

PUZZLE

AT these are interesting numbers", said Ben to Justin. He wrote three four-digit numbers on a piece of paper and then continued, "Now, what I am going to do is to apply a sequence of simple operations to each of these numbers in turn.

Here we have the three numbers:

2100 4581 8921

First we add 1 to each digit in turn, a '1' becoming a 'two'.

8970 7692 7032

Then we reverse the order of the digits:

0218 1187 2387

Now, we multiply by 8

2100 4581 8921

"As you can see, this gives us the original three numbers again. In fact, they are the only three numbers having four digits for which this is possible".

"What I would like to know is if it would work for any four-digit numbers if we were to divide by three rather than multiply in the third step?"

(Can you help Justin find any answers?)

SOLUTION TO PUZZLE OF JULY 27

Answers ORANGE = 480179 8921
= 892 021879 = 76921 and
= 021879 = 892176.

Solution: In the listing above, sample values are allocated to each of the letters in turn. Starting with the 'digit' columns of the sum, three loops are generated — lines 100 to 140 — to represent the letters E, D and S. In each case a check is carried-out to ensure that each of the values is different from the other two. Once they have been computed as possible values, the value of the letter 'F' can be calculated easily — line 150. This is tested

```

100 FOR I=0 TO 9:FOR J=0 TO 9:FOR K=0 TO 9:FOR L=0 TO 9:FOR M=0 TO 9:FOR N=0 TO 9:FOR O=0 TO 9:FOR P=0 TO 9:FOR Q=0 TO 9:FOR R=0 TO 9:FOR S=0 TO 9:FOR T=0 TO 9:FOR U=0 TO 9:FOR V=0 TO 9:FOR W=0 TO 9:FOR X=0 TO 9:FOR Y=0 TO 9:FOR Z=0 TO 9:FOR A=0 TO 9:FOR B=0 TO 9:FOR C=0 TO 9:FOR D=0 TO 9:FOR E=0 TO 9:FOR F=0 TO 9:FOR G=0 TO 9:FOR H=0 TO 9:FOR I=0 TO 9:FOR J=0 TO 9:FOR K=0 TO 9:FOR L=0 TO 9:FOR M=0 TO 9:FOR N=0 TO 9:FOR O=0 TO 9:FOR P=0 TO 9:FOR Q=0 TO 9:FOR R=0 TO 9:FOR S=0 TO 9:FOR T=0 TO 9:FOR U=0 TO 9:FOR V=0 TO 9:FOR W=0 TO 9:FOR X=0 TO 9:FOR Y=0 TO 9:FOR Z=0 TO 9:FOR A=0 TO 9:FOR B=0 TO 9:FOR C=0 TO 9:FOR D=0 TO 9:FOR E=0 TO 9:FOR F=0 TO 9:FOR G=0 TO 9:FOR H=0 TO 9:FOR I=0 TO 9:FOR J=0 TO 9:FOR K=0 TO 9:FOR L=0 TO 9:FOR M=0 TO 9:FOR N=0 TO 9:FOR O=0 TO 9:FOR P=0 TO 9:FOR Q=0 TO 9:FOR R=0 TO 9:FOR S=0 TO 9:FOR T=0 TO 9:FOR U=0 TO 9:FOR V=0 TO 9:FOR W=0 TO 9:FOR X=0 TO 9:FOR Y=0 TO 9:FOR Z=0 TO 9:FOR A=0 TO 9:FOR B=0 TO 9:FOR C=0 TO 9:FOR D=0 TO 9:FOR E=0 TO 9:FOR F=0 TO 9:FOR G=0 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What's more competitive? What kind of person is it who spends half their lives clustered in a dark room with a glare of modulator? I'm off to discover. Spectrum owners are identified by being young and hormonal, or old and still tinkering with the machine they bought when Sir Clive Sinclair created the low-end computing market. Spectrum owners (especially those models). Spectrum computer stores are now free-for-all jungle sales.

Commodore 64 folk look worried, haggard and desperate. They look worried because they realize that the 64 is seriously under-powered compared to big



The Mystery of the Mummy

boy computers and despite advertisements of yesterday claiming obsolescence, the real truth is that it is getting worse.

They look haggard because of the time spent waiting for software to load. Amiga's Diskman (which and the hard disk is in fact

HOTLINES

disappointing - both animals were really Commodore peripherals. Commodore 64 owners are desperate to upgrade but the 64P software themselves is still printing out.

The average Amiga owner is the unimproving type at the local computer club. He ditched his 4-bit system only last Christmas but is desperate to convince that he has had 16-bit power for years. Amiga shows are worthy affairs, often attended by wives, where the grown-ups talk about vertical markets, how products is transforming their lives, and try to convince the children when they start playing the latest game converted from the ST.

If your 4-bit owner wife labels and the Amiga owners are true blues, your ST owner is the one who has the power and does what he likes. This means enjoying games, a spot of WF, a dash of DTP, ST owners tend to be the commoner riders but after paying \$24.95 for



William Tell could be Comshare

games they are now serious broke.

Now for something useful. Comshare, the legend of William Tell, is coming from Screen 7 and there is a picture of it on this page. It is all about repression and William's determination to stamp out evil, rescue his son and free the land forever. Load it into your ST, Amiga, PC, 644, Spectrum, CPC and put the Tellus-brooklyn album on the turntable.

He is a man with a mission, a man determined to stamp out the evil of drug trafficking. He has

absolutely seen Death Wish 4, another all-female release from Screen 7, coming soon, called Police Angel.

Artistic has a new driving game coming - check the picture - which is a kind of Lombard RAC Rally, without the Lombard RAC. It looks satisfactory and features a world championship and gives you the chance to drive a Super Eagle, scoring 50000 sports car. It retails at \$19.99.

Had news now. The fifth land-scape in the Populous expansion disc has been changed from Sam's rat land to The Big Plains.

Mystery of the Mummy is a new release from Rainbow Arts and has digitized split tone pictures and music all over the place. It



Mummy - a legal way to die, think.

is your task to sort it all out and unravel the mystery in this intriguing adventure, available on 64, ST, Amiga and PC any time now.

Duncan Evans

PREVIEW

Program: Flendish Freddy's Big

Top 'n Fun

Version: Amiga, ST, PC

Price: Amiga, ST £29.99;

PC £34.99

Supplier: Mindscape

Previewer: Andrew Banner

RELEASE DATES

Amiga: September

ST: September

PC: September

Just how many events can you stand? We have got *Summer Games*, *Winter Games*, *California Games* and even *Caveball* *Lighty* *Nyphire* and I am going mad.

The computer scene has been swamped with these type of games but *Flendish Freddy's Big Top 'n Fun* from Mindscape is an exception. Fortunately for all of us this latest offering is very different.

As the name suggests, the game takes place under the big top and is full of humour. The circus needs to raise \$10,000 in one night to repay an overdue loan. If you fail to find the money,

you lose your circus. To raise money, you need to perform six traditional circus acts. They include the high wire walker, juggler, artist, high diving into ever-diminishing water tubs and the human cannonball.

At the end of the event you are judged by a panel of humorous clown characters, who will award a sum of money according to



The judges table.

how well you performed in the last event.

Of course, the whole idea of the circus is to get everybody laughing with the slapstick humour so many love and this is exactly what *Flendish Freddy* does. The judges also employ this laughter method and attack each other constantly. They also change their facial



Flendish Freddy's Big top o'water.

expressions to match their opinions of the past performance.

The lean sharks do not want to see the circus survive and have sent a bully boy - *Flendish Freddy* - to sort you out. Freddy will appear during the event and perform some Flendish trick to try to hamper your progress.

It all adds up to plenty of fun and unlike most other games of this kind, you will never master it or get fed up with it. The more you play it, the more you will discover and the more you will laugh.

Flendish Freddy's Big Top 'n Fun will be released on the Amiga, ST and PC in September with 8-bit versions to follow later in the year.

FAX BOX

Program: The New Zealand Story
Version: Amiga
Price: £24.99
Supplier: Ocean
Reviewer: Adrian Pumphrey

RELEASE DATES

ST: Out now
Amiga: Out now
Spectrum: Out now
Amstrad: Out now

The title of the game did not prepare me for the sight I received upon booting up this game. I have seen some strange heroes in my time but a laser-toting Kiwi wearing boomer boots? I ask you.

The game does not take long to transition from the sublime to the ridiculous, and every second of the transformation is a sheer delight. The plot is brief and bizarre. A psychotic walrus with a taste for Kiwi has 20 of your friends trapped and lined up for lunch. Escaping from the zoo you set forth with your trusty boomer to wreck a

little havoc. The landscape is constructed with a series of platforms inhabited with some very strange characters. In the early stages the common foes are the hermit crab who pops in and out of its shell and throws huge spiked balls and rockets along the platforms.

Next comes the booming, rolling soldiers and something small and furry with pointed ears. While these creatures guard the onward approach to your captured friends the skies are filled with some even stranger sights. These range from bomb dropping bats to owls mounted on ducks, very strange indeed.

With a well placed shot our fearless



• Wally Walrus is a gradee hog.

hero can steal these airborne transporters to take the battle to the skies. And if all this was not enough Kiwi can don a snorkel and enter the briny depths.

The strength of this program lies in its speed—it can take as little as 15 seconds to complete a level—in its variety, the sheer weirdness of the monsters and its mixture of cuteness and violence. The boom may not sound very violent but it can be upgraded to more deadliest weapons—and they certainly will be needed when you meet some of the walrus' larger friends.

Gameplay 78%

Graphics 82%

Sounds 70%

Overall

85%

FAX BOX

Program: Alien Legion
Version: Amiga
Price: £24.99
Supplier: Golemstar
Reviewer: Adrian Pumphrey

RELEASE DATES

Amiga: Out Now

Once more the plot is minimal. The Earth has been enslaved and as the lone surviving hero it is your task to introduce the aliens to the finer points of butting laser beams. Before you start this guided tour of war-torn Earth ensure you have an auto-fire on your joystick. A constant stream of laser beams is not only desired but essential.

Your character, Captain Cosmos, can catch a few bullets in his teeth before expiring but nothing grinds down the energy more than running into an alien you should have destroyed.

Occasionally when you terminate an alien a flash is seen floating upwards. If the flash is green, contact with it replenishes lost energy; conversely a red flash removes energy. That can be a little tricky if you kill an alien when it is almost on top of you, as the resulting flash passes through your character before you see its colour. It is bad news

if it is a red flash. The aliens may be small but they get up to all kinds of tricks. Most attack on foot, cannon-fodder style but other more wily bug-eyed monsters ride anything from contraptions better suited to a farmer's field to the latest in fighter technology.

Apart from the creatures which move on two legs, commonly known as bipeds, there are beetles like the fly, hover and creep. They include everything from abstract ships to blinking eyes.

Although the shooting element is crucial the main emphasis is on platforms. Leaping from level to level vertically is satisfactory, as long as you turn off your auto-fire first but leaping across gaps can be a real pain. You have two lengths of jump. Selection between



• Easter egg in space.



• On the surface—some green eyes and a lot of head piping doesn't fool me.

the two depends on how long you hold the joystick in the jumping position. Unfortunately in heated moments you tend to go for the short jump when you need a long jump, thus ending up in the dirt. There is nothing outstandingly good or bad about this game.

Gameplay 69%

Graphics 64%

Sounds 60%

Overall

68%

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F A X B O X

Golvellius: 73%
Price: £24.95
Altered Beast: 42%
Price: £24.95
Time Soldiers: 89%
Price: £24.95
Reviewer: Duncan Evans

C O N T A C T S

Virgin Mastertronic
 Telephone: 01-727 8009.

Good news for Sega fans is that Virgin Mastertronic, the company responsible for UK marketing, has unveiled a plethora of games on to the market. In this first article we look at *Golvellius*, *Altered Beast* and *Time Soldiers*.

I have no idea why the first game is called *Golvellius*, since it is all about the kingdom of *Alent*, a drought, a princess who goes missing, the king retiring to his deathbed and the adventures of a youth called something or other. You play that youth, on the quest for the herb to save the king, to find the princess and save the kingdom from the water shortage.

To kick off you have smooth sideways scrolling, with little furry animals gently wandering up to you. You chop them to little furry bits with your sword. That is easy enough and before you know it you are out and on to the second section. Trapped in a valley of your own making, or something like that, we go to command-style perspective, with four-way scrolling and four-way sword play, which is irritating since there are eight-



• *Golvellius* - a search for the life giving herb.

way monsters. Pop into the little holes scattered around, suffer some cute vignettes of something small and furry and

you have had one drink too many. You are lying dead drunk and some old mystic says rise from the grave and rescue my daughter and you follow the blobs. These guys attacking you look as if they have just got out of the ground; and then tiger? Surely that is Mrs Jones' Nibbles horn-down the road. Dear me, even all the characters are flashing and everything seems to be happening in slow motion.

Alternately you could play *Altered Beast* because exactly the same thing happens, except that you do not have a hangover in the morning - only the black despair at having wasted money on this poor effort.

Time Soldiers was much more to our liking. It is all about shooting your way through the various ages of time while hunting for your trapped comrades in the war against someone unpleasant. It is Commando time, with vertically-scrolling shooting action, loads of enemies, all tailored to the particular age, throwing all sorts at you.

You half disappear in the bushes and slow down; you are armed with a pre-shooting baroque and can pick up extra weapons along the way.

Just hell that alligator or prehistoric man and a rocket launcher appears; or a three-way gun or plasma weapon. It just shows those primitives were more advanced than you think.

There are plenty of time zones and on some of them the action switches so that you are scrolling horizontally.

At the end of each level there is a particularly nasty guardian - particularly large as well.

Great graphics, plenty of inventive touches, tough gameplay and satisfying amounts of violence.

Time Soldiers was certainly my pick of this bunch.



• *Altered Beast* - or the cat's been at the dumbin again.

usually helpful, then cut hacking again, until you have collected seven crystals, whence the gate to the valley of *Golvellius* opens and you are off again. It has average gameplay but pleasant graphics and reasonable sounds.

You may know what it is like when



• *Time Soldiers* - starting through the undergrowth excising those commando lookies.

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CD Connection

You have seen the games and now Duncan Evans meets the interface to revolutionise your CD system and C64.

There is no denying that CD technology is all the rage at the moment but with machines like the PC Engine, and computers like Microsoft producing *Defender of the Crown* on CD for PCs leading the way, what Rainbow Arts is about to launch on to the unsuspecting public is rather surprising.

There is a telephone socket on the circuit board and it is used to connect the interface to the LINE-outs on the back of the CD player - or the left or right channel if there is not a specific LINE-out socket.

A word of caution. I tried using my portable Sony Discman but, even with full volume, not even the music would load. If you have a portable try it in the shop that it will work before you buy.

The full-size Sanyo had no trouble about interfacing with the C64, though, and after typing LOAD, the items loaded from the spinning disc in about 40 seconds.

The menu offers 10 games and after selecting one with the cursor keys - joystick use should have been an option - you are given a track number to jump to on the CD player. Once that is accomplished, press the spacebar and the game

takes around six-and-a-half minutes, with less than one minute for the original menu, so we are talking 10 minutes of program. That is not exactly equipping the new technology, is it?

As an added treat there are seven tracks of the fabulous musical talent of Chris (Rainbow) a kind of German David Whitaker, which can be played through your speakers like a regular CD. The computer menu, to which you return once only, takes another 30 minutes. It says there are 10 of them - in the manual and on the box - but there are not.

So for what you have is a moderately quick - compared to tape - alternative method of loading programs. Except that you can only read from the CD - you cannot save anything on to it, so it has to be treated as nothing except a novel way to load programs.

Then you look at the games. You get *Janitor's Midnight Magic* (jinxed), *Landwarden*, *Minion Elevator*, *Impossible Mission*, *Drepsone*, *Lockrunner*, *Johnson's Key*, *Arks*, *M.U.E* and *POST 12*. Apart from *Arks*, which was a Rainbow Arts game anyway, the rest of the collection is prehistoric, the newest dating from 1984.

It is at this juncture that you realise that Rainbow Arts has not every corner and every road imaginable. What you are paying for is a novel way to load 10 old games - and not particularly fast - then a piece of kit which may need to be dragged round the room before you can connect it. Only if you had a CD player, did not have a disc drive or any of those games and wanted a collection of semi-classics could this strange concept be worth paying for.



• Above: Proof that interfacing, the interface releases you a QUERTY.

• Right: Four CD bundles of 10, but the games are all Rainbow Arts.

the CD *Minion* is a package which offers 10 games on a standard CD, a fairly clear instruction manual and a 24-in. by 14-in. interface, all for the Commodore 64. All you have to supply is a very standard lead and a reasonably expensive compact disc player.

The concept behind the package from the West German company more than makes for Demarc than any hardware additions is that, if you have a C64 but not a disc drive and are looking for faster data access, or faster-loading games in this case, all you have to do is plug the interface into the cassette port of the computer and connect it to an ordinary compact disc player.

It is a strange thing really, I know of very few people who have a C64 and no disc drive but can afford a CD player. Perhaps this package is aimed at someone living at home who can borrow their parents' player.

You can get to grips with this bizarre concept by plugging in the very trail-looking interface. It is not listed, as dropping the C64 on the floor with it inserted is likely to lead to a fatality.

of your disc drive loads in 30-40 seconds.

If there are loading difficulties, try the other channel as the programs are recorded on both. If that does not work you can add 30 to the track number - all 10 programs are recorded twice.

If you are thinking I have a disc drive anyway but I have a CD player and this sounds like a cool idea, let me tell you why it is not.

For one thing you are not exactly getting a CD chunk-a-block with code. Both blocks of programs



CONTACTS

1st CD Edition
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Contact: Bannington Harway
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Sir Clive speaks

Sir Clive Sinclair, latter-day computer genius, speaks in a rare interview to *Popular Computing Weekly*. Undeterred by the C5 flop, we find he has plans for two-wheels in his empire. Words by Leslie Bunder, pictures by Steve Coward.



Since forming his first company, Sinclair Radionics, in 1961, Sir Clive Sinclair has probably invented more ground-breaking electronics goods than any other individual. From radios to wristwatches and computers to cars, it can be said that Sir Clive is a man who has been there, seen it and done it. His quest for introducing something new and different often can reach the obsessive stage, like his 10-year quest for perfection in producing a pocket television set.

Even now, despite the financial failure of the C5 vehicle and the butt of many jokes, Sir Clive is still working on C10 and C11 vehicles which some day will make it on to the production lines and hopefully on to the roads.

It seems probable that it is this obsession which makes Sir Clive tick. He is a man concerned that his products should reach as many people as possible and be of benefit.

"I have a hell of a lot I want to do and I see myself at the beginning rather than the end"

to the whole of society. One has only to look at what Sir Clive has produced and you can see clearly that his products are non-elitist. The calculator, computers and car were all much cheaper than anything else on the market, and had mass appeal.

Sir Clive is not a man who copies, he took on the Japanese and Americans at their own game and won. It was because of that and his contribution to society that in 1983, at 51, Clive Martin Sinclair was knighted, due recognition for a man who created a multi-million pound industry and that does not even refer to the hardware.

Without the name Sinclair, the software games giants of Ocean, Mastertronic, Elite would not have enjoyed their massive success. Even the computer publishing industry owes its due to Sir Clive, with three magazines bearing his name as their title.

With Sir Clive's no-frills approach to competing, he also allowed companies to make such added extras as joysticks,



QUEST's keyboards and many other items for his range of machines. In short, he allowed others to create businesses via the products he produced.

Mr Clive is not generally known as a man who seeks publicity. It is several years since he spoke to *Popular Computing Weekly* or anyone else at length, as the following interview will show.

Pap: It is now almost 18 years since the ZX-80 appeared, did you think home computing would be as big as it has become?

Sinclair: Not quite as popular. I certainly hoped it would be a big thing and hoped it

"I am developing this bicycle . . . The purpose is that when you arrive at your flat, office or underground station, you can fold it instantly so that you can take it in - rather like an umbrella"

would be something which captured public imagination. We set out to try to sell to the general public, as opposed to just the enthusiasts around at the time. It grew much bigger than we hoped.

Pap: Of all the computers you have released, which is your favourite?

Sinclair: I think, in a way, the ZX-80 was a good little machine. I am very pleased with the ZX-88. I tend always to look forward to the next machine rather than look back.

Pap: How is progress on water scale integration?

Sinclair: It is coming along well. It will still be a large memory drive and the initial sales will be to the large computer manufacturers. It is still going to plan.

Pap: Can you outline plans for a portable processing device we gather you are designing?

Sinclair: That work is broadly secret so we cannot say much about it, but it would be foolish to deny it.

Pap: With Atari, Pico and Pocket releasing very lightweight pocket PCs, is this an area into which you have plans to move?

Sinclair: Very much not so. I do not see the logic behind these machines. The concept, or suggestion, is that they are PC-compatible. Well, they are simply not, because it is very important to realise what PC compatibility really means. It means for



Sir Clive Sinclair has revolutionised the world of electronics, from calculators to wrist watches.

computing. I do not ever play games myself.

Pap: What is happening with the portable telephones?

Sinclair: Sinclair Research formed a company called Ray Communications and the work is now completed. The product is now in production and will soon be on the market and Ray has since teamed with Motorola and Mercury to be one of the licensors for the telepoint system. The telephone should be a personal object like the calculator and will be priced at £150.

Pap: You once had plans for a Stock Market Notation. Do you have plans to pursue this idea again?

Sinclair: We have no plans at the moment. I do not rule it out but it is much more complicated because Sinclair Research has moved its technology out to several companies it founded - Anamarta, Ray, Cambridge Computers - and they might or might not go public and Sinclair Research might or might not go public on its own.



The ZX-88 - brought top experts the success, but Sinclair remains the visionary.

the customer total compatibility: that is to say, it must have a proper keyboard, a proper display and, in my opinion, it must have a drive. If you remove any of those or compromise on any of those the thing ceases to be compatible and you might as well go the whole hog. I cannot see the point of these products. I may be missing something. I do not say they will not sell, no doubt they will in some degree.

Pap: Do you use a £468 when you do business?

Sinclair: I do not, but then I do not use computers much anyway. I do not type and do not have a computer at home. I use a pen and calculators.

Pap: With so many games appearing on the Spectrum, do you play any?

Sinclair: No, not at all. We realised people would play games with them; the principal aim behind the machines was to introduce people to the art and science of

Pap: Will 1991 benefit British computer companies and yourself?

Sinclair: Broadly anything which opens the barriers helps but whether the barriers will come down in that area we will have to wait and see. Clearly we still have to do special keyboards for different countries. I do not see that changing. I think it is a

"I think the next generation will have computers in the home which are highly intelligent and start to give advice to people"

"I do not think it is a question of curbing the power of the computer, it is a question of how it uses its power"

psychological benefit but in practice I am not sure there will be a big change. I am concerned about the protectionism that seems to be creeping into Europe. I am worried about Europe setting up tariffs against chips coming into Europe. What I foresee is that companies in Europe might be at a greater commercial disadvantage than companies outside Europe because the Common Market might have imposed on very high prices for memory chips, the example to try and protect the internal

field we are in. If we could see a way of doing something dramatic, and we have looked at that in the past, we would do it. We are interested only if we can do something radical in the engineering side. We are interested in technical frontiers and breaking new ground and if that happens to be in the games area, we will do it. The games area does not offer us that opportunity at the moment.

Pop: Have your views on competing changed through the years?

Stclair: No, I think it is going the way I see it going. I think we are getting close to the days when students will all be carrying computers because the £40 is being used a great deal by students for that purpose. That will change computer literacy greatly. From that will emerge a nation of people who are completely familiar with computers and I think the next generation will have computers in the home which are highly intelligent and start to give advice to people.

Pop: Is it safe for computers to start forming intelligence?

Stclair: Nothing is without its risks and I think that has plenty of risks but it is a question of getting it right. I do not think it is a question of curbing the power of the computer; it is a question of how it uses its power.

Pop: Do you still have ambitions?

Stclair: Absolutely. I have a hell of a lot. I want to do and I see myself at the beginning rather than the end. There are two areas which concern me most and they are very long term products - artificial intelligence, for which I mean machines which really do rival human beings and electrical vehicles.

Pop: Regarding artificial intelligence, can you put morals into machines?

Stclair: Whether you call them morals or not, I do not know. I think you need to put constraints into them. It is something necessary that I will do.

Pop: Have you made any decisions not to release any products through fear or worry they are too intelligent?

Stclair: I have not developed products of that kind but the day may dawn when we will have to look carefully at the consequences of products as they become more powerful. I can certainly see the day when one might regret games machines - when they become so realistic that they seem just as real as life and that people can become addicted to them as they get addicted to drugs; one would be very cautious about introducing such products.

Pop: What motivates you to achieve what you have achieved?

Stclair: Well, entirely the desire to change the world in a small way, to bring out products which will make people's lives more interesting or more useful. The pocket calculator was just a tremendous thing for

people to have; so too the personal computer and I feel passionate about the portable computer. I want to produce new kinds of products which will change people's lives for the better. The home computer is a clear example of how it could enrich people's lives and now I am developing this bicycle.

Pop: Bicycle. It does not sound very electronic, can you further expand?

Stclair: The idea is very simple. It is the best way to get around town but a very inconvenient object when you arrive. If you can solve the inconvenience when you arrive, you have a very exciting product, so I'm working on that. It will be a portable bicycle. It will not be electronic and it will be two years before it appears because it is a very big job. To do it you have to use radical materials and have a radical design. The purpose is that when you arrive at your flat, office or underground station you can then fold it instantly so that you can take it in - rather like an umbrella. It must be dramatically lighter than a normal bike - and the lightest bikes have been the same weight for 100 years.

Pop: How do you feel on reflection about your portable TV?

Stclair: Perfectly sound product. We thought there would be a large market for such a product and so did the Japanese but the world market is still very small.

Pop: Can you give any weak pretences of products you have in mind?

Stclair: The main thing on which we are working is a PC-compatible portable. It is

"I can certainly see the day when one might regret games machines - when they become so realistic that they seem just as real as life and that people can become addicted to them as they are addicted to drugs"

some way off and not in the same category as the £40 and also the very advanced computer chips about which we cannot talk now.

Pop: Aside from films, do you have any other hobbies or interests?

Stclair: Yes, I am very interested in music, reading, poetry and mathematics. □



And to only put bigger, more powerful Stclair will have a few things up his sleeve.

industry which will move up the computer manufacturers.

Pop: Do you have plans to move into the development of CD-ROM?

Stclair: No, I think the application is very limited and they have been over-hyped. It has much to offer games if it is cleverly used.

Pop: Would you ever consider releasing a hand-held games machine?

Stclair: I am not really so interested in games. I see the appeal but that is not the

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Stopwatch

Steve Carter

WHEN developing a program, in most cases speed of operation is a very important factor in its success or otherwise. How do you establish the fastest way of writing a routine you think may be running too slow?

I developed this routine *Stopwatch* to use the internal clock so that I could make

alterations to a program and see the effect on the time it took to run. It is a sub-program so that none of the variables in the routine will clash with the main program when it is called on in the end. The two variables which must be placed in the main program have long names so that it is most unlikely that they will clash with any others. To use it, add it to the end of your program and put:

FirstTime%=TIMER:FirstDate%=DATE%
at the start of the section you want to time

and:
SecondTime%=TIMER%:
SecondDate%=DATE%
at the end, followed by the call to the sub-program.

The program will cope with timing a program over several weeks but if the internal clock should go into the next month your results will be incorrect, so if the timing is to go into the next month, reset the internal clock to, say, the first of the month.

```
REM -----
REM          DEMONSTRATION OF 'STOPWATCH' TIMING SUB-PROGRAM
REM -----
REM  by STEVE CARTER December 1988
CLS
PRINT "DEMONSTRATION OF USING 'STOPWATCH' SUB-PROGRAM"
PRINT " Time of starting = %TIMER"
PRINT " PRESS a KEY TO END THE PROGRAM"

Start:
FirstTime%=TIMER: FirstDate%=DATE% 'Get the time of start
WHILE INKEY$="" GOTO END 'PUT YOUR PROGRAM HERE
SecondTime%=TIMER:SecondDate%=DATE% 'Get the time of finish
REM *** call sub-program with arguments of ***
REM *** start time & date and finish time & date ***
CALL stopwatch$(FirstTime$,FirstDate$,SecondTime$,SecondDate$)
END

REM -----

SUB stopwatch$(First$,Day$,Last$,Day2$) STATIC
REM ***** CONVERT FIRST-TIME TO SECONDS *****
hrs=VAL(MID$(First$,1,2))
mins=VAL(MID$(First$,4,2))
secs=VAL(MID$(First$,7,2))
firstval=(hrs*3600) + (mins*60) + secs
REM ***** CONVERT SECOND-TIME TO SECONDS *****
hrs=VAL(MID$(Last$,1,2))
mins=VAL(MID$(Last$,4,2))
secs=VAL(MID$(Last$,7,2))
secondval=(hrs*3600) + (mins*60) + secs
REM IF TIMING PASSES MIDNIGHT ADD 24hrs TO SECOND-TIME
Hrsdays=VAL(MID$(Day2$,4,2))-VAL(MID$(Day$,4,2))
IF Hrsdays>0 THEN secondval=secondval+Hrsdays*86400
REM SUBTRACT FIRST FROM SECONDS AND CONVERT BACK
elapsedtime=secondval-firstval
hrs = INT(elapsedtime/3600)
hour$ = STR$(INT(elapsedtime/3600))
mins = INT(elapsedtime/60)-(hrs*60)
minute$ = STR$(mins)
secs = elapsedtime-(INT(elapsedtime/60)*60)
Second$ = STR$(secs)
REM ***** PRINT RESULTS *****
PRINT " Start time = %First$"
PRINT " Finish time = %Last$"
PRINT " Elapsed TIME = %hour$," hours,"
PRINT minute$," mins,"%Second$," seconds."
END SUB
```


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A day at the Beeb

Duncan Evans joins the resilient species of micro owners at Ally Pally for the BBC Show.

I owners start to look like their dogs there is a good case for computer users adopting the traits of their machines. At the BBC Show at Alexandra Palace and confused mothers led several-year BBC Master-wiring teenagers round the thirty-attended stalls, packs of Archimedes owners, looking for a spreadsheet package to work out when they would pay off the loan they took to buy the machine were everywhere.

The BBC may be outdated and dead as far as mainstream computing goes but that never seems to worry them and that is why it is so interesting that the machine they bought to educate Johnny was used only for playing *Ballistic* by Imagination Ltd for Clavin Mitty stand.

So far as this show was concerned the BBC was not dead but with only National Computer Concepts and Superior showed any real commitment. There were not many stalls left to hang into the coffin. It was the day of Archimedes but not in a manner likely to launch it into the computing mainstream.

First let us see what was on offer for the BBC. Wright & Leslie - 01-555 1000 - was getting excited about *Signature* and the very impressive

range of its for producing, displaying following for £29.95 - and £49.95 on the Archimedes. Topologies, based for released and new adventures, has gone green with a range of booklets, tapes, records and, of course, computer programs dedicated to whales, with assistance from a number of Friends of the Earth, you should telephone Topologies on 0733 244992 for details if you want your children to know about the greatest of mammals.

Substantial

More labelling software, this time from Microsoft - 04 267 2442 - entitled *The Fancy Labeler* and retails at £19.95 for the BBC B and Master 128 and £27.95 on the Archimedes. If you fancy something a little more substantial you could try the Permanent Memory Systems - 02632 22794 - *The Publisher* which claims to be a no nonsense DTP package for the entire BBC range at £39

plus VAT and £3 carriage. Compatible with View, Inter-Micro and Workline, it offers 60 fonts, 1740 was also selling its last few Gemini and Endeavour Personal Organiser ROMs.

Topical

Perhaps the biggest splash for BBC owners was made by Impact Software - 0898 654334. Impact showed entry courses for its Leaderboard class, *Stated Out* - topical because Mark Oakesworth was the Open Championship in the same week - and also a new football game.

Image resolution being 500x311. Availability is late 1990 and pricing is expected to be less than £500.

Something of a challenge was offered by the Audio Videographics Expansion Card 5024.2 which offers real-time colour digitising, grabbing frames at 1700x of a second and using its own display system to produce 1,500 colours for the finished image which can be used with most art packages. Contact Video Electronics Ltd on 0942 662222 for details.

To augment the power of the Archimedes you could always buy most of the things in the Ball

Computers - 0633 500515 - catalogue. Internal hard drives from £299 (20MB) to £445 (40MB, 20MB) and external from £449 (20MB) to £799 (40MB). If you want to see these 16-bit modes you need a multi-scan monitor - £1,495 for a 20in. screen, then you can play *Where Heide*, in other words *Heide*, for only £14.95.

For word processing with extra activities like database search, data entry and spreadsheet generation, Premier from Circle Software sounds a good choice. The price is £99 plus VAT. Contact 0793 770011. Or you might like to try *Imagination*



Reconstructed as an educational video, BBC were on still enjoy some impressive software.

Archie Server is a Microprose *Secret of the Sages* and is threatening its own version of *Click* Off, which should be available as soon as programming is finished.

Superior Software has the license to the *Pygmalion Ballistic* and is threatening its own version of *Click* Off, which should be available as soon as programming is finished.

Back to the real world with *Click*, a Master cartridge from Impact Computers - 0777 703880 - enabling the user to use notes, snapshots, times, abilities and restore functions.

Probably the most exciting aspect of the show were the protocol and real-time digitisers for the Archimedes. Wild Vision - 061 2634911 - had a huge section of hardware items for the Archimedes, including the Orion 200 series of video overlay and graphics cards. One of the most impressive things at the show was the Rank VR real-time colour digitiser. Images are displayed in any Archimedes 256-colour mode, with the

from Computer Concepts. It is powerful yet easy to use, drawing on Concepts experience of producing word processors for the BBC.

Average

Archimedes games are a little light relief - a joke some might say - but there seem to be a few of them around, mostly average conditions of classic arcade games. Considering that the Archimedes can emulate current arcade games (*Phantom*, *Street*, *Drive* - *Defender* - *Double Control* and *the the King* are not exactly slumping. They are reasonably priced, though, at £14.95 for all except *the King*, which is £19.95.

Clavin Mitty, beside the usual educational products, was looking at an *Interceptor* style game called *Interceptor* (£24.95) and selling some just ones like *Orion*, *Many Man* (*Warrior*) and *Smash* (*Breaker*).

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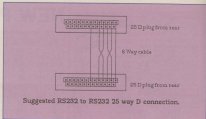
R. Oliver of Rumpstead, London writes:

Q I have an Amiga 500 and access to a dumb terminal and wonder whether it would be possible to use the two together. I know that the Amiga multi-user box is a multi-user? The terminal has a standard 25-way D connector and is RS232-compatible. If connection is possible, could you show me a wiring diagram to connect the two?

A It is possible to use a terminal with the Amiga and to get it to multi-task in a multi-user kind of way. You will need Workbench 1.3 and the ALT device.

This is like the SECL device but does not buffer any data being transferred. To set up the link, make sure both machines are off before connecting them; the Amiga serial chips have a habit of going kaput if you connect things to them while the machine is powered up.

Next, boot the Amiga and enter on the terminal. Set them both to the same RS232 speed, e.g., 9,600 bps and eight bits, 1 stop bit, no parity. Then enter MOUNT ALT on the Amiga to set up the new serial device. Follow this with SET



Suggested RS232 to RS232 25-way D connection.

NEWELL ALT, which sets up a new CLI window but directs all input and output via the RS232. You should see a prompt - say C> - appear on the terminal. If so, you are in business. If not, check the speeds, word length and so on, and then the wiring of the connecting cable. The suggested wiring shown works for my Amiga connected to an SE, i.e., both serial ports are the same pin out, all that needs to

be done is to reverse TX and RX, and RTS and CTS.

Unfortunately, the terminal has a number of limitations and obviously cannot run graphics-based applications. It can really operate only the CLI commands so other applications will not operate through the serial port.

If the Amiga had more than one RS232 it would be possible to attach a few terminals to the

system but the machine would show a good deal, especially when performing file transfers.

Incidentally, if you do not have Workbench 1.3, it is well worth spending the extra £10 or so for the upgrade. It is available from most Amiga dealers and extends most of the CLI commands and provides a number of new devices, plus an improved CLI called SHELL.

BBC buffers

T. Fother of Oad, Kent writes:

Q I am writing to you because you seem to be one of the few people who still support the old BBC micro-model B. I would like

help with the RS432 buffers and how to get characters into and out of them.

A There are two OSBYTE commands which make this reasonably easy. There are also mode buffers in the BBC:

```
DEFFPROCTX(C8)
A%=128:X%=2
Y%=ASC(C8)
CALL&FFF4
ENDPROC
```

BBC RS432 transmit procedure.

```
DEFFNRX
REPEAT
A%=145:Y%=1
T%=USR(&FFF4) AND &FF0000
UNTIL T%<0
=CHR%(T%/10000)
```

BBC RS432 receive function.

- 0 = Keyboard buffer
- 1 = RS432 input
- 2 = RS432 output
- 3 = Printer buffer (Centronics output)
- 4 = Sound channel 0
- 5 = Sound channel 1
- 6 = Sound channel 2
- 7 = Sound channel 3
- 8 = Speech

OSBYTE 145 gets a character from the specified buffer and OSBYTE 150 inserts a character. They can be accessed in two ways, e.g., *TX 150 0,40 puts an A into the keyboard buffer. A more flexible way is to use the fact that the CALL command uses the contents of A%, X%, and Y% for the OSBT registers A, X, and Y. So, to perform *TX 150 0,40, the following subject of program would be used:

```
A% = 150:Y% = 0:Y% = 40
```

```
CALL&FFF4
```

A procedure to do this is shown. Getting characters from the RS432 printer buffer requires a little more fiddling. The operating system does not return values in A%, X% and so on. Instead the Y% function must be used to get the contents of the registers.

Basic

Peter Halls of Milton Keynes, Leicestershire, writes:

Q I know you have been asked this previously but I cannot find the back issue with the answer. Could you tell me what Basic stands for?

A Beginners All-purpose Symbolic Instruction Code.

New ST mouse

N. Perry of Telford, Shropshire writes:

Q Recently I had an accident whereby I broke up my ST mouse. Can you tell me where I can get another and how much it would cost?

A A few Atari dealers supply new mice. The average price seems to be about £25. Try Microimage, 851 850 2088, £25; Data Electronics, 0752 764797, £25; Apollon Software, 01708 6180, £25.

Ludlow Computing supplies a tracker ball alternative, £19, 0775 281166.

PC emulator - Amiga

Jon Dorian of Stanley, On Durham writes:

Q I have heard of programs known as PC emulators, enabling PC software to be used on other machines. I am interested in such a program for the Commodore Amiga 500 as it will be useful to

me. Could you recommend one reasonably affordable which can run on wide a range of PC software as possible?

Aha, to me one, will I need a 1.2Mn. disc drive? If so, again, can you recommend a fairly cheap but reliable one? Can you recommend a reliable lead which would allow me to record sound from my Amiga on either a cassette recorder or hi-fi

system, preferably the former?

A I know of no software PC emulators for the Amiga. There may be one available, perhaps our readers know? There is certainly one available for the ST as it cannot be particularly difficult. Normally, PC emulation on the Amiga is performed by means of the bridge board, an add-on which includes an XT- or AT-compatible

microprocessor, depending on the board, and enables the Amiga to operate exactly like a PC. Unfortunately this works only on the AT8088, so far as I know. Does anyone know of a bridge board for the Amiga?

As regards the disc size used, many PC compatibles these days use 5.25in. discs which can certainly be read by the Amiga internal drive, so I should think a 1.2Mn. drive would be fairly redundant.

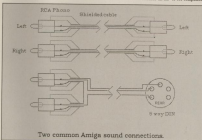
Connecting your Amiga to a tape recorder or a hi-fi is easy. It is probably the easiest machine for doing it. The Amiga sound output is via two RCA phono sockets at the back. It is stereo, so one must go to the left channel and one to the right.

The hi-fi connection is easiest, since all you need is a dual phono to dual phono lead, it is available from almost all hi-fi shops.

This pre-supposes that your hi-fi has the standard RCA phono connectors, which it should have if it is less than 10 years old.

If your connections are different you will have to figure the pin-outs and ask the hi-fi dealer if such a lead exists; it almost certainly will.

I have shown the two commonest connections in the accompanying diagram.



Spectrum Cheap Joy

M. Davies of Broadstairs, Kent writes:

Q I read with interest your Spectrum joystick interface article - June 88 - but note that you test it only on one joystick with some software. I thought you might like to see a diagram for an interface which uses a 501, i.e. Kensington Standard, but may be constructed for less than half the cost of your design. I built the unit in a Syntron keyboard along with a Sinclair ZX Spectrum interface and three stick sockets. It operated successfully with old and new software for more than two years; the Sinclair standard interface uses 74LS00, 74LS16 and 80 resistors. It is not very pretty so I have not included details, but it works.

I use a Ferguson M801 television set for my display which also has an RGB input. RGB sound and earth are satisfactory but what are you and you? Is the input analogue or TTL compatible? Do you or any readers have a circuit suitable for an RGB interface to the M801? Finally, would an RGB display be

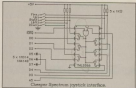
better than the composite video signal I use at the moment from 'RF video input'?

I realise Ferguson used to make an interface to suit the Spectrum but I would like to save some money and leave the edge connector free by building it inside the keyboard.

A I suspect my mistake was in using the 8011 chip as this is a rather expensive compared to the 74LS008. If you want to interface other gauglets to the Spectrum, the 8011 is a versatile device for just a joystick interface your solution is better and cheaper. Thank you for sending it.

With respect to your questions, I admit that I am no expert on the Ferguson M801. I think you and you? are probably right - composite? - for the horizontal and vertical sync. Presumably they could be used with, say, the 8011 which produces separate sync signals.

Whether the RGB in the Ferguson is analogue or digital I do not know but I suspect that it is digital as I have seen wiring diagrams for using it with the Spectrum 128 - and the like which use digital RGB as far as I know.



Unfortunately I do not have a circuit to convert the Spectrum composite video signals to RGB, as you say, adapters exist, so if anyone knows the details send them to me and I will let everyone in on the secret. I may be wrong but most video systems start with RGB signals at some point in their circuitry. They are then converted to composite video and pushed through a UHF modulator for use with a TV. I can only presume that the Spectrum does this as well, what you need is a circuit diagram for it.

The normal method of producing a video image is to get values for the RGB levels from the computer memory image.

These three signals are combined to form composite video and then a UHF signal. All this playing around introduces distortion, so an RGB signal, straight from the source, should produce the best image. I suspect that the adapters which produce RGB for the Spectrum split the composite signal and to introduce yet more distortion.

Keeping up with the Clives'

When I bought my 25-41 with its rickety RAM pack and spaggy keyboard I definitely felt that I had entered a new stage of my career. Suddenly I had become part of the computer revolution instead of being an outsider. Many of the programs being published then were fairly elementary and written in Basic. Allen wrote graphics characters which staggered across the screen and which were shot down by painfully slow missiles.

You could understand the programs, change them, improve them or write better ones. You felt like a pioneer and the letters and articles in the magazines reinforced that. We were all nervous looking for an understanding of this marvelous equipment on which we had laid our hands and looking for the problems to solve on it. The lure of obtaining a second income or even becoming fully independent to work in the comfort of your own home beckoned.

The limitations of the 25-41 quickly became obvious and I graduated to the Commodore to get my hands on a real home computer with reasonably high-resolution graphics, colour, sound and a proper keyboard. The horizon had expanded. Nothing seemed impossible and I made some money out of it by using the computer for word processing and getting a few small programs published. Even then it appeared that it was possible to reach the level of the professionals with some application.

I did some business programming and learned at first hand what the computer books do not

tell you - professional-level programming is three hard work calling for a high degree of concentration and attention to detail. They do not mention the need to acquire the ability to second-guess what an inexperienced user will make of your on-screen test messages and the need to make the program bug-free and error-trapped.

Writing programs is not easy as it looks and I expect that there are many computers collecting dust in cupboards after owners abandoned the dream of becoming a programmer.



Undaunted, I struggled to master machine code and improve my Basic to try to turn home to write high-quality programs. Even as I was doing so a new generation of computers was appearing on the market. They had very high-resolution graphics, a superb range of colours, full quality sound and a compilation to match. Games programs became a pleasure to watch because of the quality of the graphics, even though they were the same old plots

retained time and again.

Allen had gone from blaise to detailed figures which interacted with each other; the background music was now a recognizable tune and the scenery rolled smoothly across the picture. Competitors appeared to encourage graphics programmers to display their best work.

The quality of some of the winning pictures was so good that you had to look twice to see if they were not really photographs. There were those sequences of swinging, shiny balls complete with accurate and changing reflections. Real art, beautiful things which must have taken hundreds of hours of work to create. Some of the finest sequences appear on television where it is becoming increasingly difficult to strain past the computer-generated from the real.

I can only stand back and admire such industry. I know I cannot compete. I do not have the equipment, the experience or time. You are likely to acquire it, the technology has advanced out of my reach and I cannot keep up with it. I have moved a step back to become a user rather than a creator. It is not that I have lost interest - far from it the fascination lingers, but I spend more time writing about it than doing it.

Fortunately, no program has yet been written which can generate even simple articles. I do not resent being out of the mainstream of computing, but the advances in technology have taken away my dreams. Where has the magic of those early days gone?

Peter George

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ELECTRONIC TIMES

Intergraph, Papyrus, Battle Chess, North Pole, Powerdrome - you EA have a lot to talk about. We showed a tape recorder in the window and listened to.

FLY BY NIGHT

See Papyrus go on another tour around a Worcester living room - this time in Dave Marshall's F-14 Combat Pilot.

AUCTION

Cheap and cheerful items can be had at lower than bargain prices - if you know where to look.

PRINT DUMP

Yet another Printer launched and yes, you saving sharing, clipping and taking flap collies, were there to review the machine.

Plus...

All the LATEST news from the U.K. and the U.S., media-fests with Sam Gamell, your listings, our reviews of the best games of the week and your letters. And Yours Truly might just creep in (oh by - edit).

INTERFACE BY BRIAN COOKMAN



TARGHAN



Silmarils

What the name Tarantula means:

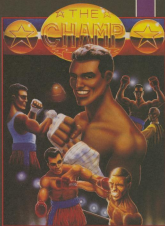
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